



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,589	09/07/2006	Masayuki Ono	043887-0178	9166
53080 7590 02/18/2010 MCDERMOTT WILL & EMERY LLP 600 13TH STREET, NW WASHINGTON, DC 20005-3096				
EXAMINER				
KALAM, ABUL				
ART UNIT		PAPER NUMBER		
2814				
MAIL DATE		DELIVERY MODE		
02/18/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/560,589

Applicant(s)

ONO ET AL

Examiner

Abul Kalam

Art Unit

2814

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 15-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 November 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB06)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date 10/12/09

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-3, 5 and 10 rejected under 35 U.S.C. 102(b) as being anticipated by Seo (US 2002/0053871; previously cited).

Regarding claim 1, Seo discloses a light-emitting device (Fig. 6, ¶ [0098]-[0103]) comprising:

- a first electrode (602);
- a second electrode (606) provided to be opposite to the first electrode (602); and
- a light-emitting layer (603) which contains a metal oxide semiconductor porous body (¶ [0098], by the surface of which an organic light-emitting material (605, Fig. 6) is supported, and is provided between the first electrode (602) and the second electrode (606).

Regarding the limitation of wherein the organic light-emitting material is chemisorbed to the surface of the metal oxide semiconductor porous body, note that such a limitation is inherent in Seo's structure, since Seo discloses a method of forming the light-emitting layer (¶ [0064], [0102]) which is substantially identical to that disclosed by the Applicant (see ¶ [0199] of US 2007/0007538 which is a publication of the instant application). It has been held, where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or

substantially identical processes, a prima facie case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

Regarding claim 2, Seo discloses wherein the metal oxide semiconductor porous body is composed of a metal oxide semiconductor particulate powder (§§ [0069]-[0070]).

Regarding claim 3, Seo discloses wherein the metal oxide semiconductor particulate powder is made of an n-type semiconductor material (§§ [0099]).

Regarding claim 5, Seo discloses the device further comprising at least one organic layer (604, Fig. 6) provided between the first electrode and the second electrode (602 and 606) in addition to the light-emitting layer (603), the organic layer containing an adhesive organic material (§§ [0101]: "PEDOT") so as to function as an adhesive layer through which adjacent upper and lower layers thereof are bonded together.

Regarding claim 10, Seo discloses wherein the adhesive organic material (§§ [0101]: "PEDOT") in the organic layer (604) contains at least a polymer-based material.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor

and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seo ('871), as applied to claims 1 and 5 above, in view of Roitman et al. (US 2003/0057828, previously cited, hereinafter, Roitman).

Regarding claim 6, Seo discloses all the limitations of the claim, as set forth above in claims 1 and 5, with the exception of disclosing a spacer dispersed in the organic layer, by which the thickness of the organic layer is defined. However, Roitman discloses an analogous organic light emitting device, wherein a spacer (310, Fig. 4) is dispersed in the organic layer (308), by which the thickness of the organic layer is defined (§ [0023]).

Regarding claim 7, Roitman discloses wherein the spacer (310, Fig. 4) is composed of transparent or semi-transparent particles (§ [0023]).

Regarding claim 8, Roitman discloses wherein the spacer (310, Fig. 4) is made of an insulating material (§ [0023]).

Regarding claim 9, Roitman does not disclose that the particle diameter of the spacer is in the range of 0.001 to 10 μm . However, However, it has been held that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 105 USPQ 233, 234 (CCPA 1955). Furthermore, where patentability is said to be based upon particular chosen range or dimension recited in a claim, the Applicant

must show that the chosen range or dimension is critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Seo and Roitman, to form the organic layer with a spacer, for the disclosed intended purpose of improving the transparency of the organic layer (Roitman: ¶ [0023]).

3. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seo ('871), as applied to claims 1 and 5 above.

Regarding claims 11 and 12, Seo discloses (Fig. 6) wherein one of the first or second electrode (606) is an electron injection electrode (¶ [0101]) and one of the first or second electrode (602) is a hole injection electrode (¶ [0099]), and the organic layer is a hole injection layer (604, ¶ [0101]). Thus, in the embodiment of Figure 6, Seo does not disclose wherein the organic layer is a hole transport layer. However, in the embodiment of Fig. 3, Seo discloses wherein the organic layer (304b) is a hole transport layer (¶ [0074]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the organic layer as a hole transport layer, because such a modification is well known and conventional in the semiconductor art. Regarding, the limitation of "wherein the hole transport layer functions as an adhesive layer through which adjacent upper and lower layers thereof are bonded together," note that such a limitation is drawn to a function. It has been held that an apparatus must be distinguished from the prior art in terms of structure rather than function. *In re*

Schreiber, 128 F.3d 1473, 1477-78, 44USPQ2d 1429, 1431-32 (Fed. Cir. 1997) (The absence of a disclosure in a prior art reference relating to function did not defeat the Board's finding of anticipation of claimed apparatus because the limitations at issue were found to be inherent in the prior art reference); see also *In re Swinehart*, 439 F.2d 210 212-13, 169 USPQ 226, 228-29 (CCPA 1971); *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

Regarding claim 13, Seo does not disclose a hole injection layer provided between the hole injection electrode and the hole transport layer. However, Seo discloses a hole injection layer (604) formed on a hole injection electrode (602) in the embodiment of Fig. 6 and a hole transport layer (304b) is formed on a hole injection electrode (302b) in the embodiment of Fig. 3B. Thus, forming a hole injection layer between the hole injection electrode and a hole transport layer would have been obvious to one of ordinary skill in the art at the time of the invention, because such a configuration of an organic light emitting device is well known and conventional in the semiconductor art.

Regarding claim 14, Seo discloses in the embodiment of Fig. 3B, an electron transport layer (306b) provided between the electron injection electrode (307b) and the light emitting layer (303b and 305b). Thus, forming an electron transport layer between the electron injection electrode and the light-emitting layer would have been obvious to one of ordinary skill in the art at the time of the invention, because such a configuration

of an organic light emitting device is well known and conventional in the semiconductor art.

Response to Arguments

4. Applicant's arguments filed November 20, 2009, have been fully considered but they are not persuasive.

Applicant argues:

"The luminescent layer 404 is formed by spin coating or dip coating using a PPV derivative solution in which the PPV derivative is dissolved in toluene. As such, Seo does not disclose chemisorption of the organic light-emitting material. Thus, it is clear that Seo fails to teach or suggest all the limitations of the amended independent claim 1 of the present disclosure."

Examiner's reply:

The argument is not persuasive. The "spin coating or dip coating" applicant refers to in his arguments against Seo, are also the same methods applicant teaches for forming the light-emitting layer (see ¶ [0199] of US 2007/0007538 which is a publication of the instant application). Furthermore, Seo also teaches that the light emitting layer may be formed by dissolving a metal alkoxide and a constitutional material of the organic compound layer into the same solvent, and then a hydrolysis and a heat treating is performed after coating this solution on the electrode.

Thus, it is inherent that Seo's light-emitting material is chemisorbed to the surface of the metal oxide semiconductor porous body, since Seo's method of forming the light emitting layer is substantially identical to that of the Applicant's. As stated above, it has been held, where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or

obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abul Kalam whose telephone number is (571)272-8346. The examiner can normally be reached on Monday - Friday, 9 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. K./
Examiner, Art Unit 2814

/Wael M Fahmy/
Supervisory Patent Examiner, Art
Unit 2814